# WELCOME TO

FLOOD MANAGEMENT IN THE CHAO PHRAYA RIVER BASIN

**Thailand 2006** 

#### 1) GENERAL CHARACTERISTICS OF THE CHAO PHRAYA RIVER

- CATCHMENT AREA
  UPPER PART
  LOWER PART
- LAND USE
- POPULATION
- CAPACITY OF THE RIVER NETWORK
- HISTORIC RECORDS OF FLOODING
- FLOOD DAMAGE
- AGENCY CONCERNED

# GEOLOGICAL FORMATION ON THAILAND





CHAO PHRAYA RIVER BASIN AND FLOOD PLAIN



FLOOD RISK AREA

(35,000 sq.km.)

CATCHMENT AREA (157,925 sq.km.)

**IRR AREA** 

1942 1970 1975 1978 1980 1983 1995 1996 2000

MEDIUM FLOOD @ 3 W YEARS

VICE ARGE FLOOD @ 25



# TOPOGRAPHIC FEATURES OF THE CHAO PHRAYA BASIN



### CHAO PHRAYA RIVER BASIN

CATCHMENT AREA 157,925 sq.km.

#### **UPPER BASIN**

Ping Wang Yom Nan (100,000 sq.km.)

#### LOWER BASIN

Chao Phraya Sakekrang Pasak Thachin

(57,925 sq.km.)

#### LANDUSE IN THE BASIN



### POPULATION AND LANDUSE IN THE BASIN

RIVER	POPULATION	BASIN AREA	LAND USE (RAI)				
		(RAI)	HOUSEHOLD	AGRICULTURE	FOREST	WATER AREA	ETC.
Ping (P)	2,384,946	21,186,250	536,012	5,940,625	13,991,400	249,998	468,215
Wang (W)	717,928	6,744,375	190,191	1,758,258	4,402,707	41,142	352,057
Yom (Y)	1,711,112	14,760,000	237,636	7,459,704	6,698,087	11,786	352,787
Nan (N)	2,354,766	21,456,250	227,940	10,692,017	9,646,811	270,865	618,617
Chao Phraya ((	CP)11,477,193	12,578,125	912,000	10,860,574	477,968	213,072	114,511
Sakaekrang (Sl	K) 461,542	3,244,375	6,034	1,937,830	1,226,437	7,937	66,137
Pasak (PS)	1,340,559	10,182,500	214,851	6,503,563	2,311,428	10,183	1,142,475
Thachin (TC)	2,572,201	8,551,250	417,529	7,158,488	855,125	58,300	61,808
SUM	23,020,247	98,703,125	2,742,193	52,311,059	39,609,983	863,283	3,176,607
%	-	100.00	2.78	53.00	40.13	0.87	3.22
PER AREA							

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#### **SOCIO-ECONOMIC CONDITION IN THE BASIN**

	(SQ,KM.)	(10 <sup>6</sup> RAI)	(MILLION)	(PER AREA)	(MB.)	(BATH/HEAD/Y)
Ping (P)	33,898	21.19	2.385	70	121,022	46,432
Wang (W)	10,791	6.74	0.718	67	31,172	43,429
Yom (Y)	23,616	14.76	1.711	72	53,431	33,771
Nan (N)	34,330	21.46	2.355	69	82,546	33,923
Chao Phraya (CP)	20,125	12.58	11.477	570	2,105,979	134,804
Sakaekrang (SK)	5,191	3.24	0.462	89	17,805	38,825
Pasak (PS)	16,292	10.18	1.340	82	70,946	68,424
Thachin (TC)	13,682	8.55	2.572	188	210,641	87,712
SUMAVG.	157,925	987	23.020	146	2,693,542	60,915



# IRRIGATION PROJECTS IN THE BASIN



# CHAOPHRAYA RIVER AND CANAL SYSTEM



# INUNDATION MAP OF 1978 FLOOD



Source : RID Regional Officers 7 and 8

GULF OF THAILAND

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SCALE 25

50 km

### **INUNDATION MAP OF 1980 FLOOD**





### **INUNDATION** MAP OF 1983 **FLOOD**





Officer 7 nad 8

### INUNDATION MAP OF 1995 FLOOD









## 1996 INUNDATION MAP OF 1996 FLOOD





#### **River and Flooding Condition**

Area	River	Stretch	Flow Capacity (m <sup>3</sup> /s)	Inundation Volume in 1995	
Upper Central Plain	Nan	Phisanulok to Chao Phraya River 1,000 to 2,0			
	Yom	Sukhothai to Nan River	50 to 1,100	5 billion m	
Nakhon Sawan Area	Chao Phraya	Nakhon Sawan to Chainat	2,500 to 4,500	1 billion m <sup>3</sup>	
Higher Delta	Chao Phraya	Chainat to Ayutthaya	4,200 to 1,300	7 billion m <sup>3</sup>	
Lower Delta	Chao Phraya	below Ayutthaya	2,900 to 3,200	o	
	Chao Phraya	BMA Flood Barrier *	3,600	3 Dillion m	

\*: On-going Project

#### Flood Damage in 1995 Flood



### 2) CAUSES OF FLOODING IN THE CHAO PHRAYA RIVER BASIN

- RAIN LOCAL FLOODING
- RUNOFF FROM SURROUNDING AREA
- TIDAL EFFECT
- UPSTREAM DISCHARGE BASIN FLOODING
- **CONFINEMENT EFFECT**
- POOR/IMPROPER OPERATION OF RESERVOIRS

# 3) PRESENT FLOOD PROTECTION ACTIVITIES

## FLOOD PROTECTION BY AGENCIES CONCERNED

- WRD: WATER RESOURCES DEPARTMENT
- **RID** : ROYAL IRRIGATION DEPARTMENT
- DPT : DEPARTMENT OF PUBLIC WORKS AND COUNTRY & TOWN PLANING
- BMA : BANGKOK METROPOLITAN ADMINISTRATION
- LAD : LOCAL ADMINITRATION DEPARTMENT



### LOCATION OF EXISTING/ PROPOSE DAMS IN THE CHAOPHRAYA BASIN

RID



## DIKE ALIGNMENT

**RID** 

#### **RID DRAINAGE FACILITIES AND**

#### **ON GOING PROJECT**





# **Polder System Concept**

### **BANGKOK METROPOLITAN AREA : POLDER SYSTEM**





# RIVER IMPROVEMENT PLAN FOR URBAN AREA (BANGKOK)



# SAMPLE OF URBAN DIKE ALONG THE CP. RIVER



# SAMPLE OF URBAN DIKE ALONG THE CP. RIVER



# SAMPLE OF URBAN DIKE ALONG THE CP. RIVER

# SAMPLE OF URBAN DIKE ALONG THE CP. RIVER



# BMA PUMPING STATION ALONG THE DIKE

# 4) FORMULATION OF FLOOD MITIGATION PLAN







• SHORT TERM PLAN (5 YRS.)



• INTERMEDIATE TERM PLAN (15 YRS.)



• LONG TERM PLAN (25 YRS.)

# **STRUCTURAL MEASURE**



- RESERVOIR
- **RIVER IMPROVEMENT**
- **URBAN POLDER SYSTEM**
- AGRICULTURAL POLDER SYSTEM
- CONSTRUCTION TEMPORARY STORAGE BASIN



# RETARDING BASIN





#### SHORT TERM PLAN

#### **MODIFICATION OF ROR**

#### FORECASTING& WARNING

**FLOOD RESPONSE** 

**FLOOD RISK MAP** 

#### LANDUSE



# NON-STRUCTURAL MEASURE

### **FLOOD FORECASTING / WARNING SYSTEM**



#### NETWORK OF TELEMETERING SYSTEM



# FLOOD FIGHTING PLAN BY LAD.











## 6) IMPROVEMENT OF MANAGEMENT

# IMPROVEMENT OF MANAGEMENT ORGANIZATION

# SETUP THE DIRECTION AND FRAMEWORK

# PLUBLIC PARTICIPATION

#### **PROPOSED ORGANIZATION CHART OF RIVER BASIN COMMITTEE**



#### THANK YOU

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